

September 20, 2016

Meagan E. Ormand
Golder Associates Inc.
2108 W. Laburnum Ave.
Suite 200
Richmond, VA 23227

RE: Project: Bremo Weekly Process
Pace Project No.: 92312697

Dear Meagan Ormand:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Nicole Gasiorowski
nicole.gasiorowski@pacelabs.com
Project Manager

Enclosures

cc: Ron DiFrancesco, Golder Associates Inc.
Martha Smith, Golder Associates Inc.
Mike Williams, Golder Associates Inc



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Bremo Weekly Process
Pace Project No.: 92312697

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174
Alabama Certification #: 41320
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074

Nebraska Certification: NE-OS-28-14
Nevada Certification: FL NELAC Reciprocity
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
Wyoming Certification: FL NELAC Reciprocity
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

Charlotte Certification IDs

9800 Kinsey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712

North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Eden Certification IDs

205 East Meadow Road Suite A, Eden, NC 27288
North Carolina Drinking Water Certification #: 37738

North Carolina Wastewater Certification #: 633
Virginia/VELAP Certification #: 460025

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Bremo Weekly Process

Pace Project No.: 92312697

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92312697001	T4-160913-1455-S3	SM 2540D	KCE	1	PASI-E
		EPA 350.1 1993 Rev 2.0	KCE	1	PASI-E
		SM 4500-Cl-E-2011	KCE	1	PASI-E
		EPA 1664B	JMS	1	PASI-C
		EPA 200.7	RVK	1	PASI-O
		Trivalent Chromium Calculation	HEA	1	PASI-O
		EPA 200.8	CKJ	10	PASI-O
		EPA 245.1	WAB	1	PASI-A
		EPA 218.7	AEM	1	PASI-O

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: SM 2540D

Description: 2540D TSS, Low-Level, Eden

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for SM 2540D. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: EPA 350.1 1993 Rev 2.0

Description: 350.1 Ammonia

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for EPA 350.1 1993 Rev 2.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: SM 4500-Cl-E-2011

Description: 4500 Chloride

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for SM 4500-Cl-E-2011. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: EPA 1664B

Description: HEM, Oil and Grease

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for EPA 1664B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: EPA 200.7

Description: 200.7 MET ICP

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: Trivalent Chromium Calculation

Description: Trivalent Chromium Calculation

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for Trivalent Chromium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: EPA 200.8

Description: 200.8 MET ICPMS

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for EPA 200.8. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 200.8 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Bremo Weekly Process
Pace Project No.: 92312697

Method: EPA 245.1
Description: 245.1 Mercury
Client: Golder_Dominion_Bremo
Date: September 20, 2016

General Information:

1 sample was analyzed for EPA 245.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 245.1 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Method: EPA 218.7

Description: Hexavalent Chromium by IC

Client: Golder_Dominion_Bremo

Date: September 20, 2016

General Information:

1 sample was analyzed for EPA 218.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo Weekly Process

Pace Project No.: 92312697

Sample: T4-160913-1455-S3		Lab ID: 92312697001		Collected: 09/13/16 14:55		Received: 09/16/16 14:25		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
2540D TSS, Low-Level, Eden		Analytical Method: SM 2540D							
Total Suspended Solids	ND	mg/L	1.0	1		09/19/16 12:52			
350.1 Ammonia		Analytical Method: EPA 350.1 1993 Rev 2.0							
Nitrogen, Ammonia	ND	mg/L	0.20	1		09/19/16 14:08	7664-41-7		
4500 Chloride		Analytical Method: SM 4500-Cl-E-2011							
Chloride	38.9	mg/L	5.0	5		09/19/16 13:02	16887-00-6		
Field Data		Analytical Method:							
Collected By	L. Hamelman			1		09/13/16 15:02			
Collected Date	09/13/16			1		09/13/16 15:02			
Collected Time	14:55			1		09/13/16 15:02			
Field pH	7.8	Std. Units	0.10	1		09/13/16 15:02			
HEM, Oil and Grease		Analytical Method: EPA 1664B							
Oil and Grease	ND	mg/L	5.0	1		09/20/16 07:56			
200.7 MET ICP		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Tot Hardness asCaCO3 (SM 2340B	155000	ug/L	3300	1	09/18/16 14:13	09/19/16 14:48			
Trivalent Chromium Calculation		Analytical Method: Trivalent Chromium Calculation							
Chromium, Trivalent	ND	ug/L	5.0	1		09/20/16 13:25	16065-83-1		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	ND	ug/L	5.0	1	09/18/16 14:13	09/19/16 15:54	7440-36-0		
Arsenic	64.5	ug/L	5.0	1	09/18/16 14:13	09/19/16 15:54	7440-38-2		
Cadmium	ND	ug/L	1.0	1	09/18/16 14:13	09/19/16 15:54	7440-43-9		
Copper	ND	ug/L	5.0	1	09/18/16 14:13	09/19/16 15:54	7440-50-8		
Lead	ND	ug/L	5.0	1	09/18/16 14:13	09/19/16 15:54	7439-92-1		
Nickel	ND	ug/L	5.0	1	09/18/16 14:13	09/19/16 15:54	7440-02-0		
Selenium	ND	ug/L	5.0	1	09/18/16 14:13	09/19/16 15:54	7782-49-2		
Silver	ND	ug/L	0.40	1	09/18/16 14:13	09/19/16 15:54	7440-22-4		
Thallium	ND	ug/L	1.0	1	09/18/16 14:13	09/19/16 15:54	7440-28-0		
Zinc	ND	ug/L	25.0	1	09/18/16 14:13	09/19/16 15:54	7440-66-6		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	ND	ug/L	0.10	1	09/19/16 02:50	09/19/16 11:12	7439-97-6		
Hexavalent Chromium by IC		Analytical Method: EPA 218.7							
Chromium, Hexavalent	ND	ug/L	1.0	1		09/19/16 12:20	18540-29-9		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo Weekly Process
Pace Project No.: 92312697

QC Batch:	329196	Analysis Method:	SM 2540D
QC Batch Method:	SM 2540D	Analysis Description:	2540D TSS, Low Level, Eden
Associated Lab Samples:	92312697001		

METHOD BLANK: 1824389 Matrix: Water
Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	1.0	09/19/16 12:50	

LABORATORY CONTROL SAMPLE: 1824390

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	250	264	106	90-110	

SAMPLE DUPLICATE: 1824391

Parameter	Units	92312661001 Result	Dup Result	RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo Weekly Process

Pace Project No.: 92312697

QC Batch:	329211	Analysis Method:	EPA 350.1 1993 Rev 2.0
QC Batch Method:	EPA 350.1 1993 Rev 2.0	Analysis Description:	350.1 Ammonia, EDEN
Associated Lab Samples:	92312697001		

METHOD BLANK: 1824514 Matrix: Water

Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.20	09/19/16 14:02	

LABORATORY CONTROL SAMPLE: 1824515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1824516 1824517

Parameter	Units	92312661001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
			Spike Conc.	Spike Conc.							
Nitrogen, Ammonia	mg/L	ND	5	5	4.6	4.7	90	92	90-110	3	

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QUALITY CONTROL DATA

Project: Bremo Weekly Process

Pace Project No.: 92312697

QC Batch: 329185

Analysis Method: SM 4500-Cl-E-2011

QC Batch Method: SM 4500-Cl-E-2011

Analysis Description: 4500 Chloride, EDEN

Associated Lab Samples: 92312697001

METHOD BLANK: 1824298

Matrix: Water

Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	09/19/16 12:51	

LABORATORY CONTROL SAMPLE: 1824299

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	10	10.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1824300 1824301

Parameter	Units	92312661001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Chloride	mg/L	40.3	10	10	49.8	49.2	95	90	90-110	1	

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QUALITY CONTROL DATA

Project: Bremo Weekly Process
Pace Project No.: 92312697

QC Batch:	329325	Analysis Method:	EPA 1664B
QC Batch Method:	EPA 1664B	Analysis Description:	1664 HEM, Oil and Grease
Associated Lab Samples:	92312697001		

METHOD BLANK: 1824908 Matrix: Water
Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Oil and Grease	mg/L	ND	5.0	09/20/16 07:55	

LABORATORY CONTROL SAMPLE: 1824909

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	40	34.0	85	78-114	

MATRIX SPIKE SAMPLE: 1824910

Parameter	Units	92312480001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Oil and Grease	mg/L	ND	40	36.4	91	78-114	

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QUALITY CONTROL DATA

Project: Bremo Weekly Process

Pace Project No.: 92312697

QC Batch: 329099

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury

Associated Lab Samples: 92312697001

METHOD BLANK: 1823843

Matrix: Water

Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.10	09/19/16 11:00	

LABORATORY CONTROL SAMPLE: 1823844

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1823845 1823846

Parameter	Units	92312661001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	92	93	70-130	1	

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QUALITY CONTROL DATA

Project: Bremo Weekly Process
Pace Project No.: 92312697

QC Batch:	321235	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 MET
Associated Lab Samples:	92312697001		

METHOD BLANK: 1709601 Matrix: Water
Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Tot Hardness asCaCO3 (SM 2340B	ug/L	ND	3300	09/19/16 14:04	

LABORATORY CONTROL SAMPLE: 1709602

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tot Hardness asCaCO3 (SM 2340B	ug/L	82700	83100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1709603 1709604

Parameter	Units	35265902001		MS		MSD		MS		MSD		% Rec Limits	RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Tot Hardness asCaCO3 (SM 2340B	ug/L	32500	82700	82700	117000	113000	102	98	70-130	3				

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QUALITY CONTROL DATA

Project: Bremo Weekly Process
Pace Project No.: 92312697

QC Batch: 321234 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 92312697001

METHOD BLANK: 1709595 Matrix: Water
Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	09/19/16 15:19	
Arsenic	ug/L	ND	5.0	09/19/16 15:19	
Cadmium	ug/L	ND	1.0	09/19/16 15:19	
Copper	ug/L	ND	5.0	09/19/16 15:19	
Lead	ug/L	ND	5.0	09/19/16 15:19	
Nickel	ug/L	ND	5.0	09/19/16 15:19	
Selenium	ug/L	ND	5.0	09/19/16 15:19	
Silver	ug/L	ND	0.40	09/19/16 15:19	
Thallium	ug/L	ND	1.0	09/19/16 15:19	
Zinc	ug/L	ND	25.0	09/19/16 15:19	

LABORATORY CONTROL SAMPLE: 1709596

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	50	50.8	102	85-115	
Arsenic	ug/L	50	51.2	102	85-115	
Cadmium	ug/L	5	5.1	102	85-115	
Copper	ug/L	50	53.4	107	85-115	
Lead	ug/L	50	51.8	104	85-115	
Nickel	ug/L	50	51.8	104	85-115	
Selenium	ug/L	50	51.6	103	85-115	
Silver	ug/L	5	5.3	106	85-115	
Thallium	ug/L	50	52.0	104	85-115	
Zinc	ug/L	250	262	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1709597 1709598

Parameter	Units	35265897002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Antimony	ug/L	0.50U	50	50	49.2	51.2	98	102	70-130	4	
Arsenic	ug/L	0.0039 mg/L	50	50	48.5	49.7	89	92	70-130	2	
Cadmium	ug/L	0.00005 U mg/L	5	5	4.4	4.6	89	92	70-130	4	
Copper	ug/L	0.93U	50	50	43.0	43.8	86	87	70-130	2	
Lead	ug/L	0.00050 U mg/L	50	50	52.2	53.3	104	107	70-130	2	
Nickel	ug/L	0.62U	50	50	44.5	45.1	88	89	70-130	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo Weekly Process

Pace Project No.: 92312697

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1709597											
1709598											
Parameter	Units	35265897002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Selenium	ug/L	0.52J	50	50	35.5	36.6	70	72	70-130	3	
Silver	ug/L	0.050U	5	5	4.3	4.4	87	89	70-130	2	
Thallium	ug/L	0.50U	50	50	52.1	53.8	104	108	70-130	3	
Zinc	ug/L	11.8	250	250	226	225	86	85	70-130	0	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1709599											
1709600											
Parameter	Units	35265900005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
Antimony	ug/L	0.50U	50	50	52.8	52.1	105	104	70-130	1	
Arsenic	ug/L	0.0060 mg/L	50	50	56.5	55.7	101	99	70-130	2	
Cadmium	ug/L	0.00005 0U mg/L	5	5	5.2	5.1	104	101	70-130	2	
Copper	ug/L	0.93U	50	50	50.9	50.0	101	100	70-130	2	
Lead	ug/L	0.00050 U mg/L	50	50	54.0	53.1	108	106	70-130	2	
Nickel	ug/L	4.0	50	50	55.3	54.6	103	101	70-130	1	
Selenium	ug/L	1.1	50	50	50.5	50.0	99	98	70-130	1	
Silver	ug/L	0.050U	5	5	5.1	5.0	101	100	70-130	1	
Thallium	ug/L	0.50U	50	50	54.4	53.4	109	107	70-130	2	
Zinc	ug/L	25.8	250	250	259	254	93	91	70-130	2	

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QUALITY CONTROL DATA

Project: Bremo Weekly Process
Pace Project No.: 92312697

QC Batch:	320989	Analysis Method:	EPA 218.7
QC Batch Method:	EPA 218.7	Analysis Description:	Chromium, Hexavalent IC
Associated Lab Samples:	92312697001		

METHOD BLANK: 1707753 Matrix: Water
Associated Lab Samples: 92312697001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium, Hexavalent	ug/L	ND	1.0	09/19/16 11:15	

LABORATORY CONTROL SAMPLE: 1707754

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	ug/L	.075	.072J	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707757 1707758

Parameter	Units	92312085003 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
			Spike Conc.	Spike Conc.							
Chromium, Hexavalent	ug/L	0.24	.025	.025	.26J	.26J	90	98	85-115	1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1710138 1710139

Parameter	Units	92311904011 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
			Spike Conc.	Spike Conc.							
Chromium, Hexavalent	ug/L	ND	.075	.075	.079J	.079J	105	106	85-115	0	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Bremo Weekly Process

Pace Project No.: 92312697

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A Pace Analytical Services - Asheville

PASI-C Pace Analytical Services - Charlotte

PASI-E Pace Analytical Services - Eden

PASI-O Pace Analytical Services - Ormond Beach

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo Weekly Process

Pace Project No.: 92312697

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92312697001	T4-160913-1455-S3	SM 2540D	329196		
92312697001	T4-160913-1455-S3	EPA 350.1 1993 Rev 2.0	329211		
92312697001	T4-160913-1455-S3	SM 4500-CI-E-2011	329185		
92312697001	T4-160913-1455-S3				
92312697001	T4-160913-1455-S3	EPA 1664B	329325		
92312697001	T4-160913-1455-S3	EPA 200.7	321235	EPA 200.7	321267
92312697001	T4-160913-1455-S3	Trivalent Chromium Calculation	321620		
92312697001	T4-160913-1455-S3	EPA 200.8	321234	EPA 200.8	321266
92312697001	T4-160913-1455-S3	EPA 245.1	329099	EPA 245.1	329103
92312697001	T4-160913-1455-S3	EPA 218.7	320989		

REPORT OF LABORATORY ANALYSIS

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The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

(or /

92312697

92312697

F-ALL-Q-020rev.08, 12-Oct-2007

	Document Name:	Document Revised: May 24, 2016
	Sample Condition Upon Receipt(SCUR)	Page 1 of 2
	Document No.: F-MEC-CS-009-Rev.03	Issuing Authority: Pace Mechanicsville Quality Office

Page 2 of 2 for Internal Use ONLY

Sample Condition Upon Receipt

Client Name:

Golden/Bremo

Project #

W0# : 92312697

Courier:

☐ Commercial

☐ Fed Ex

☐ UPS

☐ USPS

☐ Client

☒ Pace

☐ Other:


92312697

Custody Seal Present?

☒ Yes

☐ No

Seals Intact?

☐ Yes

☐ No

Packing Material:

☐ Bubble Wrap

☒ Bubble Bags

☐ None

☐ Other:

Thermometer:

☒ RMD001

☐

Type of Ice:

☒ Wet

☐ Blue

☐ None

☐ Samples on ice, cooling process has begun

Correction Factor: 0.0°C

Cooler Temp Corrected (°C):

1.3

Biological Tissue Frozen?

☐ Yes

☐ No

☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)?

☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

			Comments/Discrepancy:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.	
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.	
Short Hold Time Analysis (<72 hr.)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	3.	
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.	
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.	
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	7.	
Samples Field Filtered?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.	Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.	
-Includes Date/Time/ID/Analysis Matrix: <u>WW</u>			
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.	HNC3 pH<2 HCl pH<2 H2SO4 pH<2 NaOH pH>12 NaOH/ZnOAc pH>9
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Samples checked for dechlorination?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.	
Headspace in VOA Vials (>5-6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.	
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted:

Date/Time:

Comments/Sample

Discrepancy:

Project Manager SCURF Review:

NMG

Date:

allalil

Project Manager SRF Review:

NMG

Date:

allalil

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A Required Client Information: Company: Golder Associates Address: 2108 W Laburnum Ave, Ste 200 Richmond, VA 23227 Email To: Mormand@golder.com Phone: 804-551-0129 Fax: 804-358-2900 Requested Due Date/TAT: 3-24-08		Section B Required Project Information: Report To: Mormand@golder.com Copy To: Martha_Smith@golder.com Address: Ron_Difrancesco@golder.com Purchase Order No.: 172655 Project Name: Bremo Weekly Project Number: 1520-347.22.0		Section C Invoice Information: Attention: Meagan Ormand Company Name: Golder Associates Address: galapdataentry_invoices@golder.com Pace Quote Reference: Pace Project Manager: Pace Profile #:		Page: 1 of 1	
Section D Required Client Information: Valid Matrix Codes: DRINKING WATER DW WASTE WATER WT PRODUCT P SOIL/SOLID S OIL O WASTE W OTHER OT TISSUE TS SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		COLLECTED COMPOSITE START DATE TIME COMPOSITE END/GRAB DATE TIME SAMPLE TEMP AT COLLECTION		PRESERVATIVES Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other		Requested Analysis Filtered (Y/N) V/N	
MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP) RELINQUISHED BY / AFFILIATION DATE TIME		ACCEPTED BY / AFFILIATION DATE TIME		SAMPLE CONDITIONS Received on Ice (Y/N) Cooled (Y/N) Samples Intact (Y/N)		Temp in °C	
ADDITIONAL COMMENTS All analyses to be performed under Golder-Pace MSA dated 12/19/2008		ADDITIONAL COMMENTS All analyses to be performed under Golder-Pace MSA dated 12/19/2008		ADDITIONAL COMMENTS All analyses to be performed under Golder-Pace MSA dated 12/19/2008		ADDITIONAL COMMENTS All analyses to be performed under Golder-Pace MSA dated 12/19/2008	
ITEM # 1 2 3 4 5 6 7 8 9 10 11 12		T4-160913-1455-S3 9/13/16 14:55 9/16/16 14:25 9/16/16 15:56 9/16/16 15:56		200.8 - Sb, As, Cd, Cr (III) 200.8 - Pb, Ni, Se, Zn, Cu 200.8 - Ag, Th 245.1 - Hg 218.6(7) - Cr (VI) SM4500 - Chloride 1664B - Oil & Grease 350.1 - Ammonia-N SM2540D - TSS 200.7 - Hardness Residual Chlorine (Y/N)		92312697 Pace Project No./ Lab I.D. pH analysis @ 15°C: pH = 7.8	
Regulatory Agency NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>		Site Location VA		STATE:		Temp in °C	
SAMPPLER NAME AND SIGNATURE PRINT Name of SAMPLER: L. Hamilton SIGNATURE of SAMPLER: <i>[Signature]</i>		DATE Signed (MM/DD/YYYY): 09/13/16		Temp in °C		Samples Intact (Y/N)	